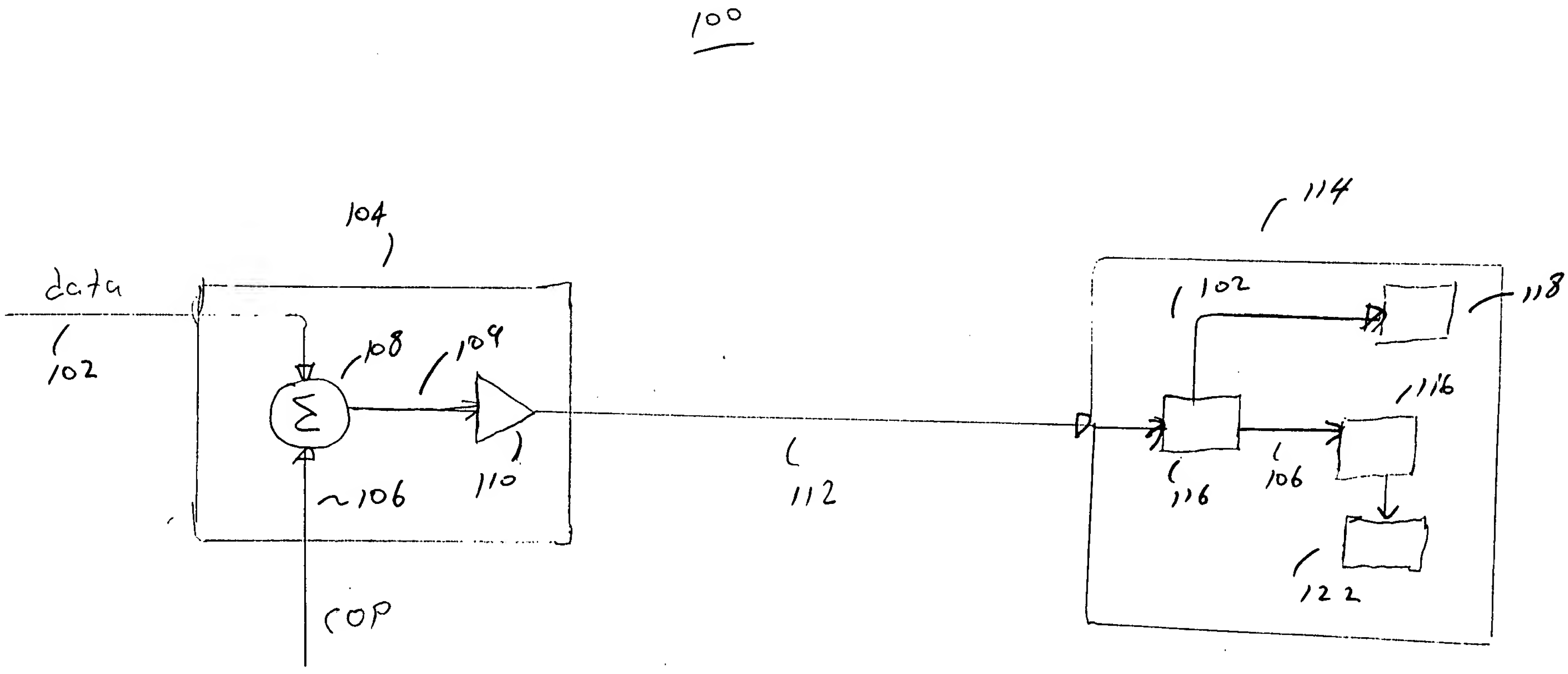
FIG. 1


100
data
102
104
108
104
110
~106
COP
112
114
102
118
116
116
106
122

200

FIG 2

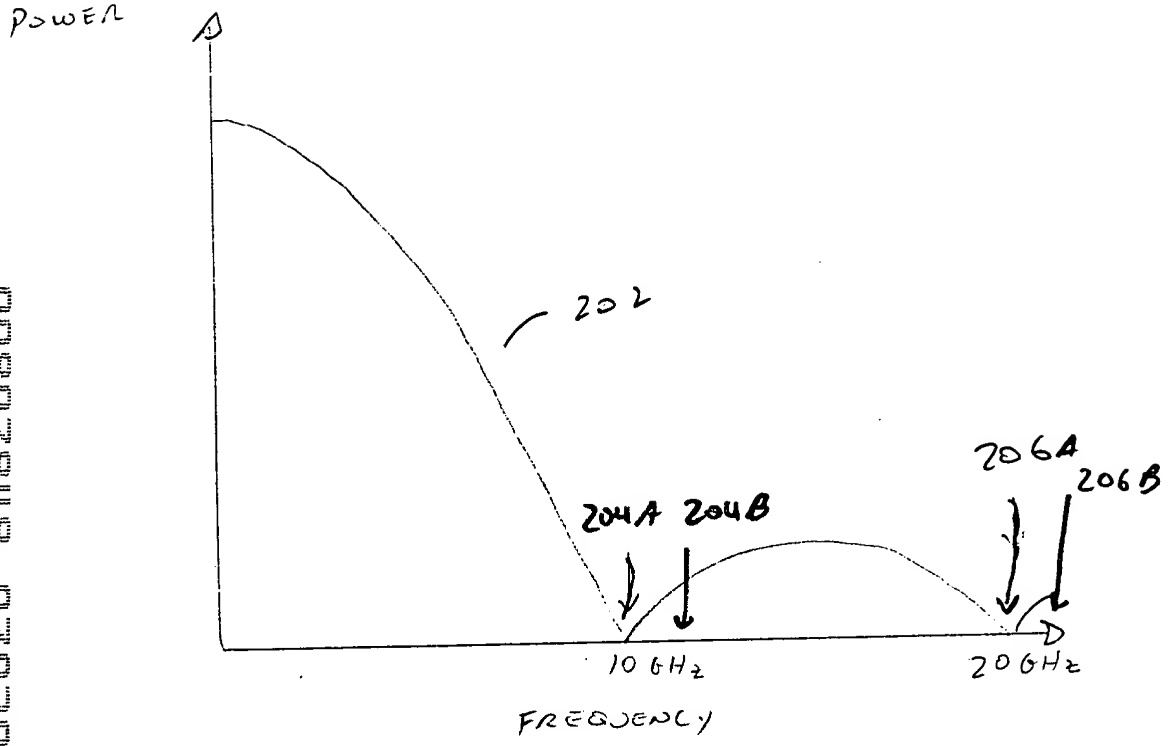
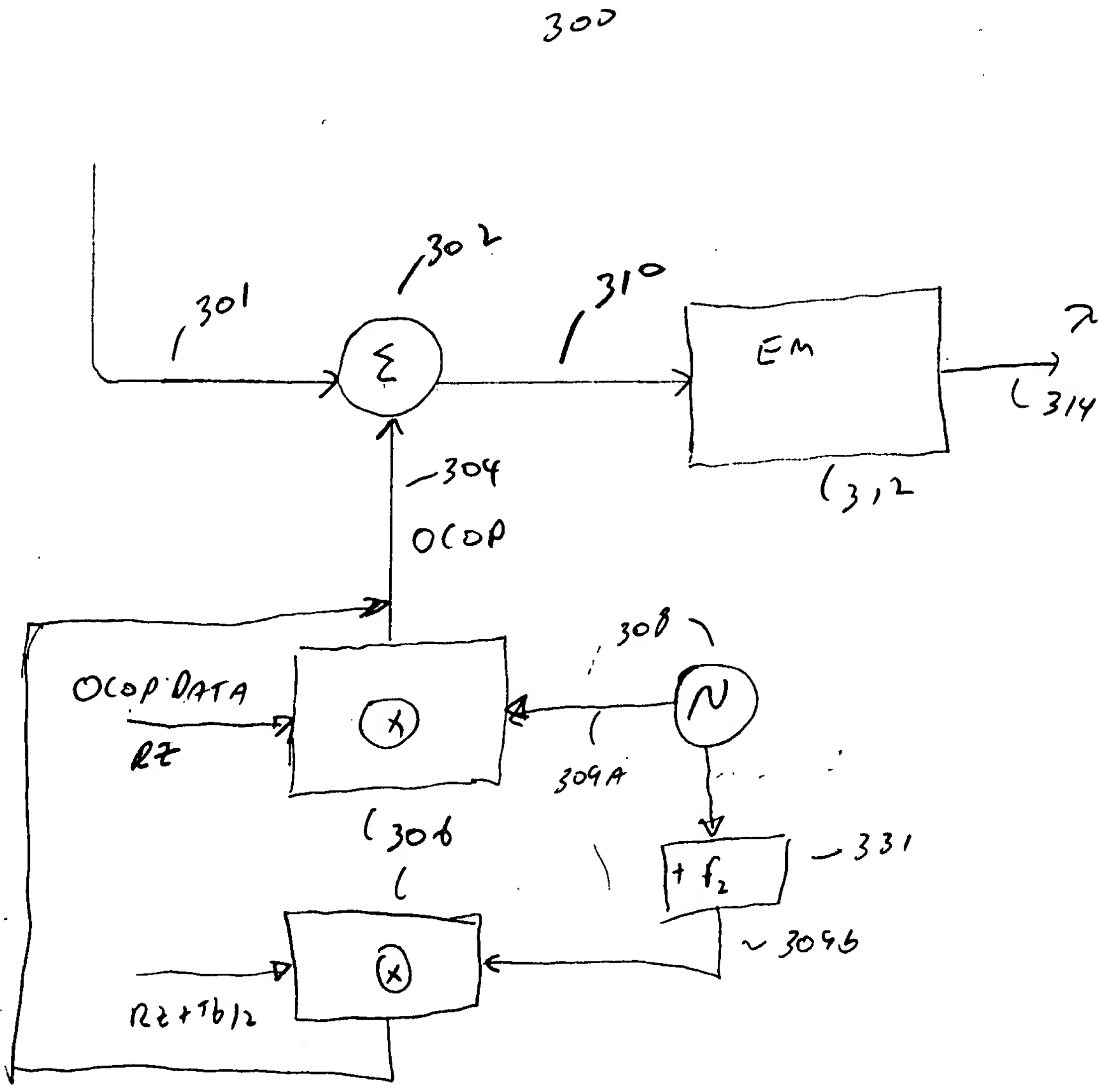


FIG. 3A


300
301
302
Σ
310
EM
314
312
304
OCOP
OCOP DATA
RZ
308
309A
306
331
+ f₂
309B
RZ+Tb/2

3B

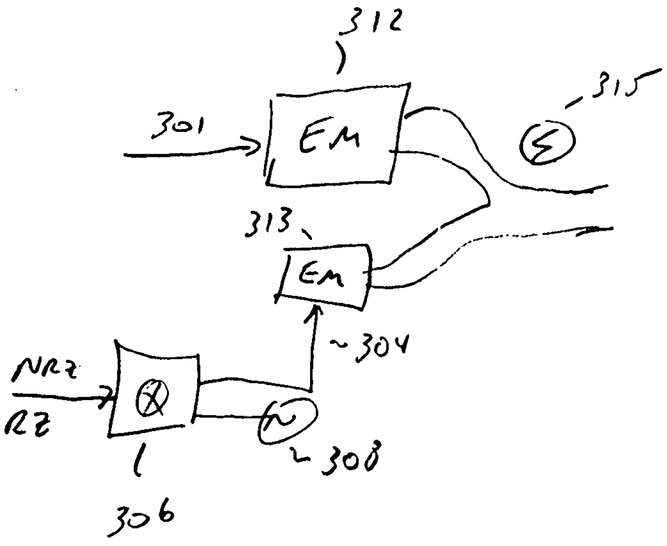

312
301
EM
315
Σ
313
EM
304
NRZ
RZ
306
308

FIG. 4 400

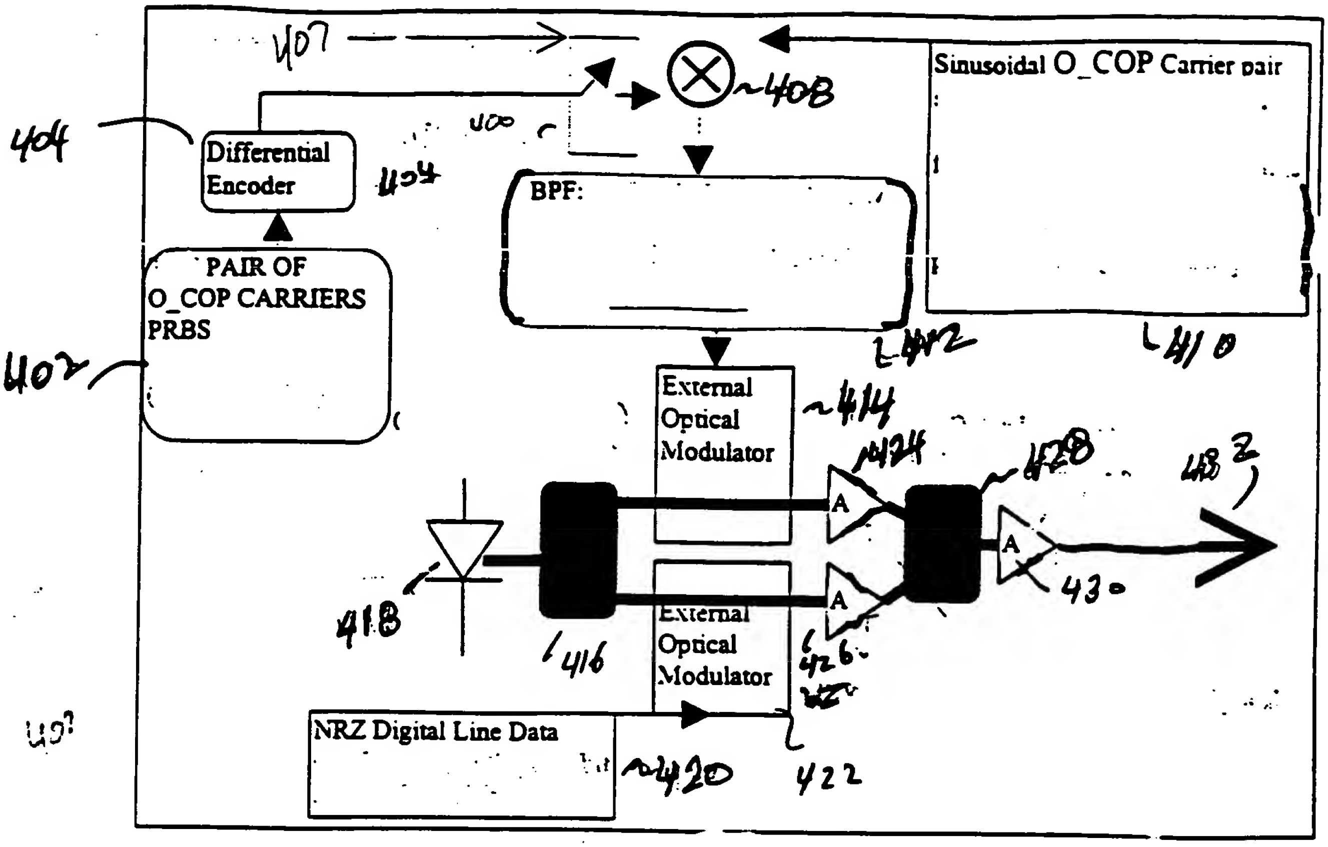


FIG. 5 500

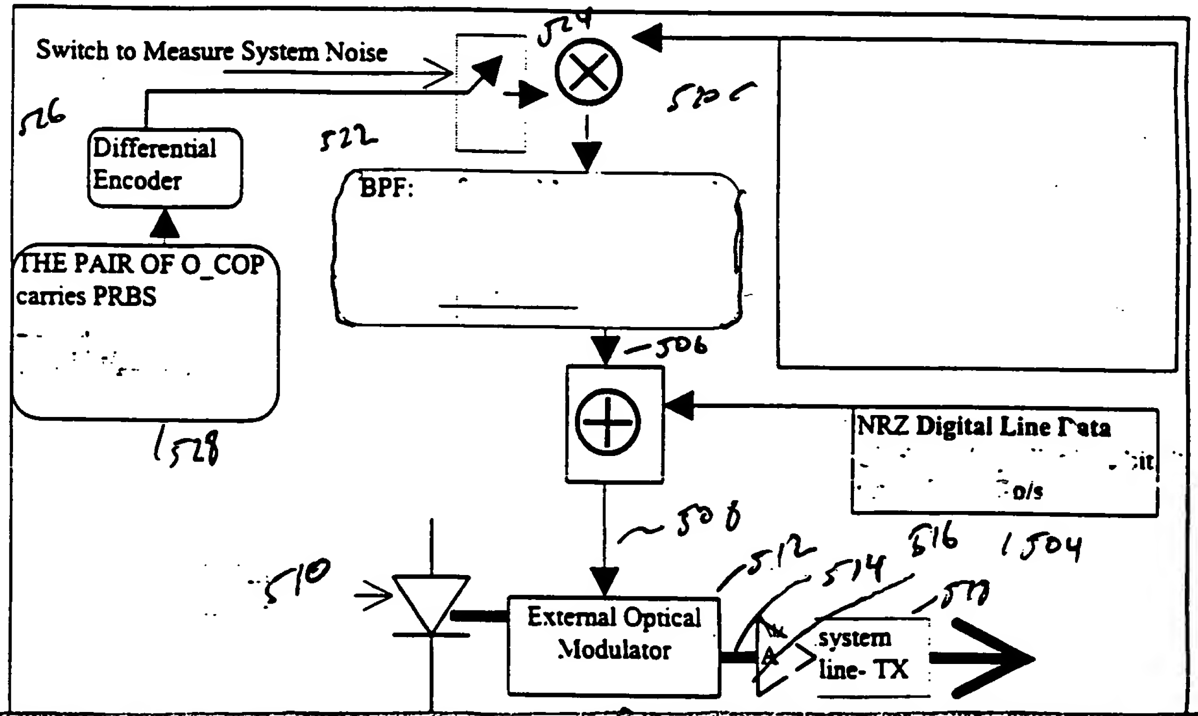
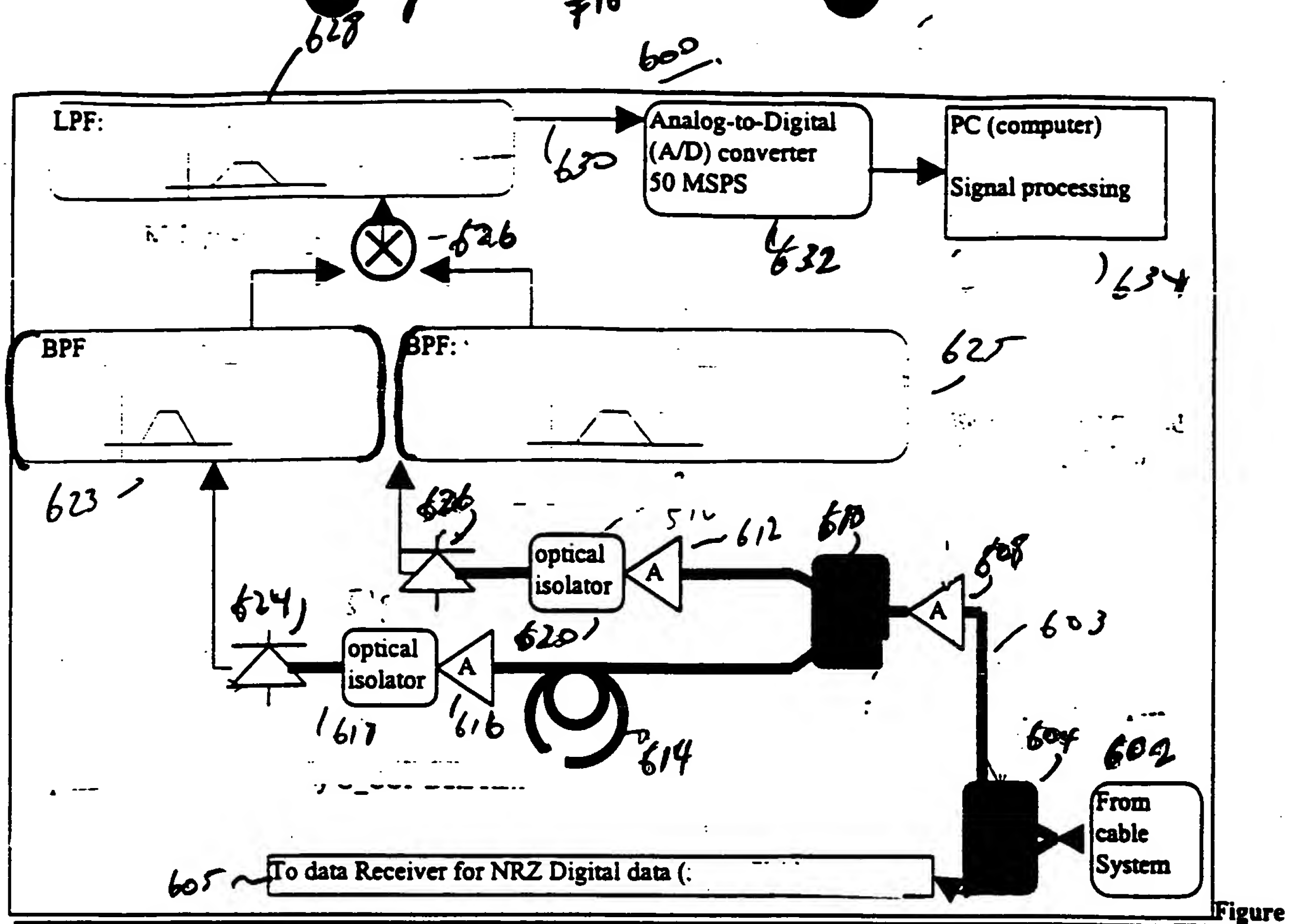
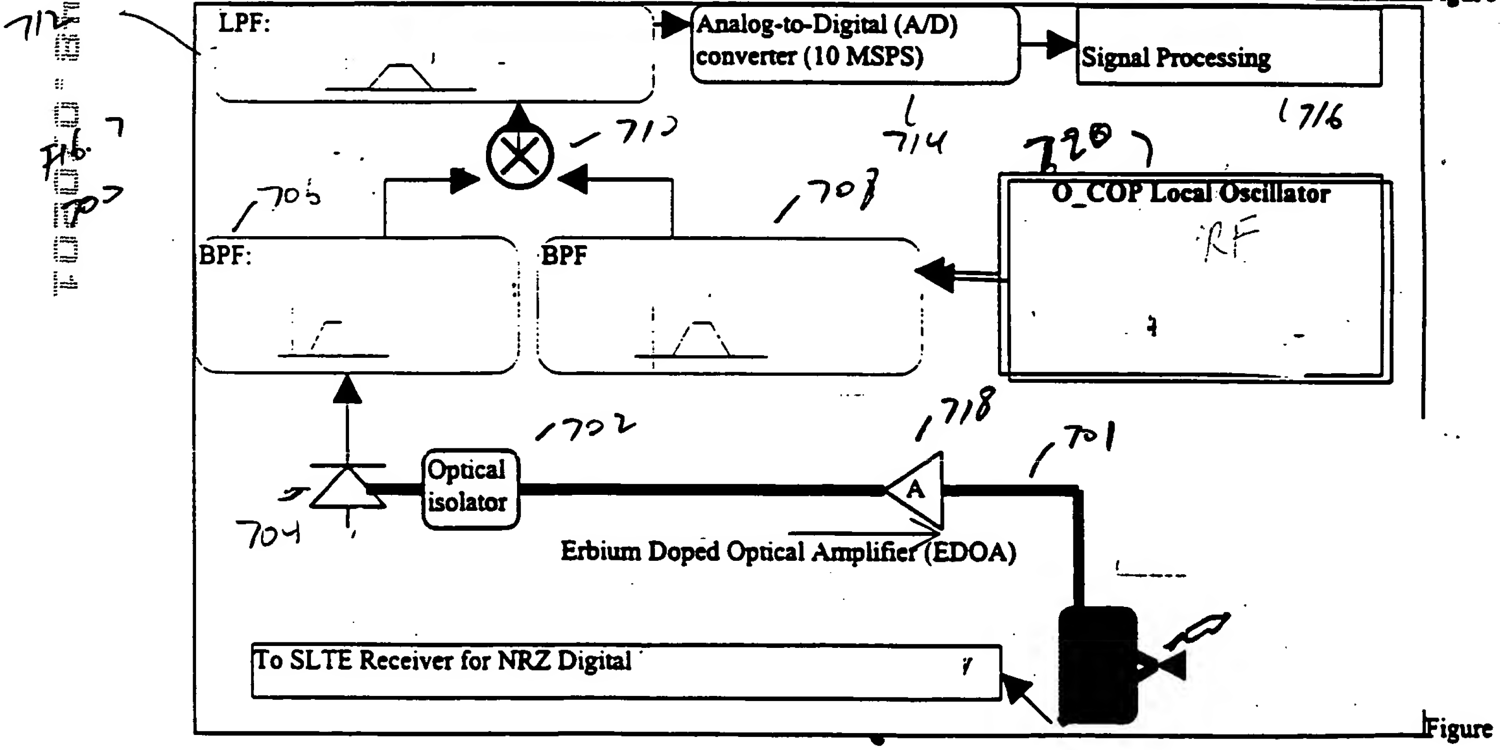


FIG. 6



628
600
LPF:
Analog-to-Digital (A/D) converter 50 MSPS
630
PC (computer)
Signal processing
632
634
626
BPF
BPF:
625
623
626
610
612
optical isolator
A
608
624
optical isolator
A
620
603
617
616
614
604
602
From cable System
605
To data Receiver for NRZ Digital data (:
Figure

FIG. 7



712
LPF:
Analog-to-Digital (A/D) converter (10 MSPS)
Signal Processing
716
714
710
720
O_COP Local Oscillator
RF
707
705
708
BPF:
BPF
718
702
701
Optical isolator
A
704
Erbium Doped Optical Amplifier (EDOA)
To SLTE Receiver for NRZ Digital
Figure

FIGURE 8

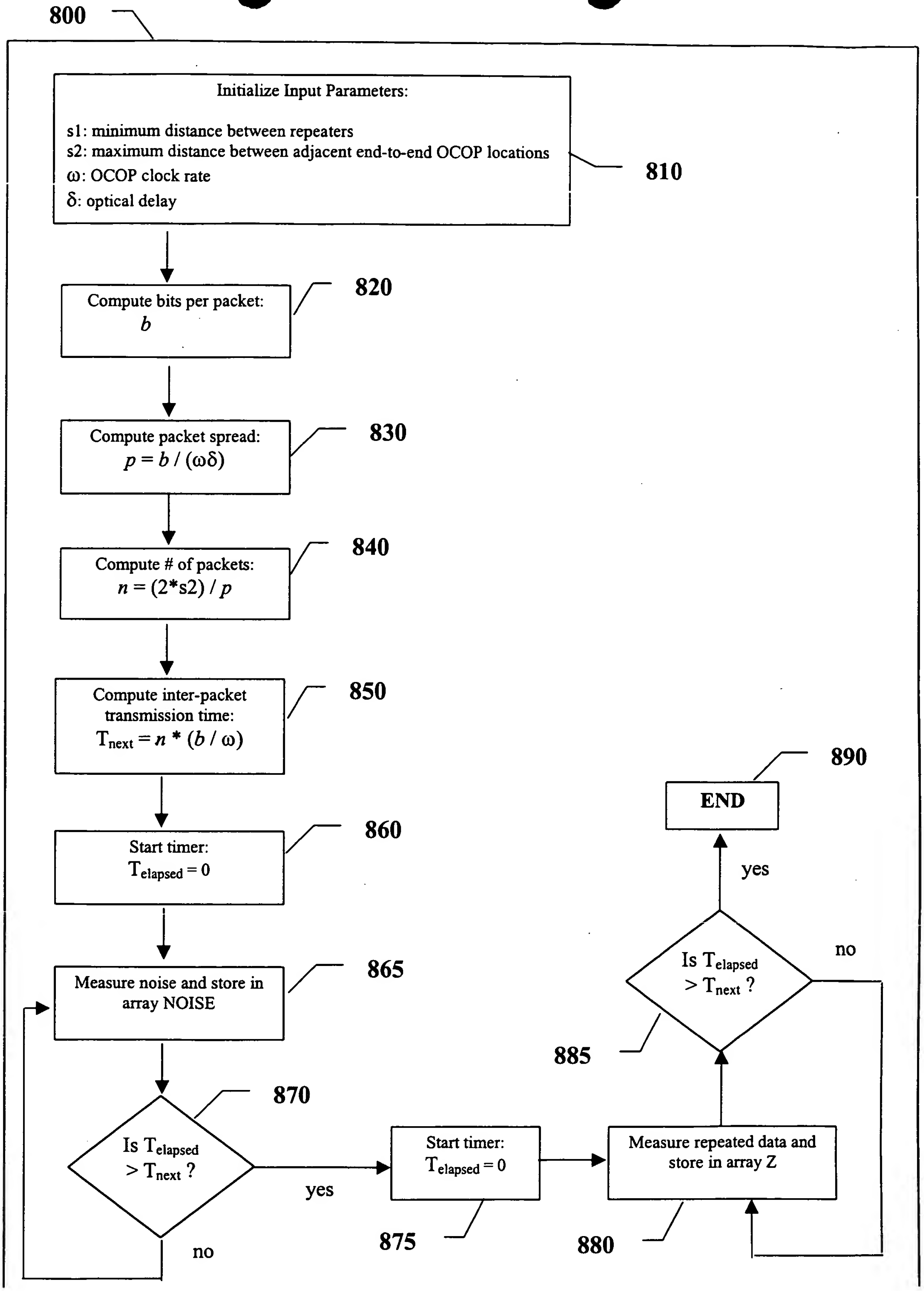
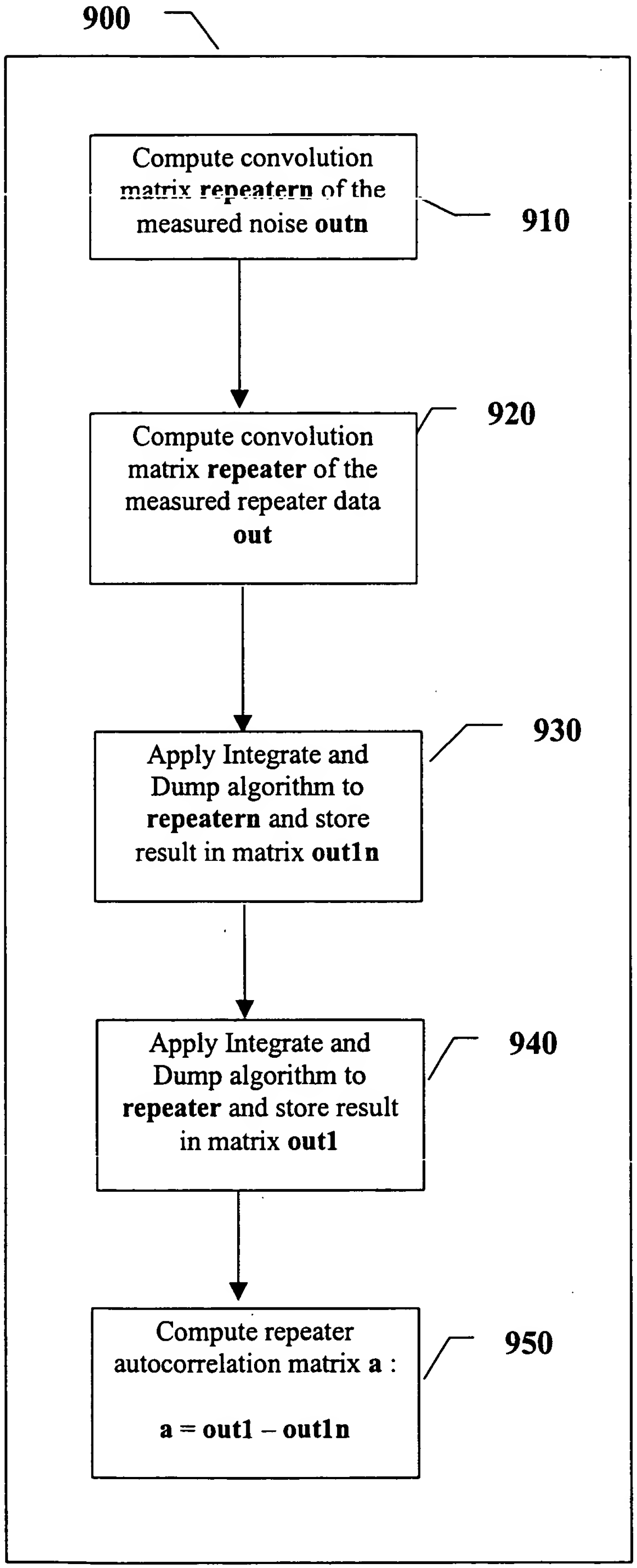

800
Initialize Input Parameters:
s1: minimum distance between repeaters
s2: maximum distance between adjacent end-to-end OCOP locations
ω: OCOP clock rate
δ: optical delay
810
Compute bits per packet:
b
820
Compute packet spread:
p = b / (ωδ)
830
Compute # of packets:
n = (2*s2) / p
840
Compute inter-packet transmission time:
T_next = n * (b / ω)
850
Start timer:
T_elapsed = 0
860
Measure noise and store in array NOISE
865
Is T_elapsed > T_next ?
870
yes
no
Start timer:
T_elapsed = 0
875
Measure repeated data and store in array Z
880
Is T_elapsed > T_next ?
885
yes
no
END
890

FIGURE 9:


900
Compute convolution matrix **repeatern** of the measured noise **outn**
910
Compute convolution matrix **repeater** of the measured repeater data **out**
920
Apply Integrate and Dump algorithm to **repeatern** and store result in matrix **out1n**
930
Apply Integrate and Dump algorithm to **repeater** and store result in matrix **out1**
940
Compute repeater autocorrelation matrix **a** :
a = out1 – out1n
950